

TRIO

McNair Scholars Program
ST. OLAF COLLEGE

Summer Research 2014 Abstract Booklet



<http://wp.stolaf.edu/mcnair/>

TRIO McNair is a graduate school preparatory program funded by the U.S. Department of Education and sponsored by St. Olaf College. It was founded in 1989 and initiated at St. Olaf College in 2007. Nationally there are 158 McNair programs working with over 4,400 low-income, first-generation, and underrepresented undergraduate students. (The federal government defines “underrepresented” to include: Black; Hispanic; American Indian/Alaskan Native, Native Hawaiians and other Pacific Islanders.) The program is further described on our website: <http://wp.stolaf.edu/mcnair/>.

Program Goals

The federal goal of the TRIO McNair Scholars Program is to increase the number of low-income, first-generation, and underrepresented students who participate in undergraduate research, graduate with a B.A., and immediately enter and complete graduate school, with a specific focus on obtaining a Ph.D. The program identifies students with high academic potential and provides opportunities for students to develop skills necessary to gain admission to and successfully complete graduate study.

All TRIO McNair projects must meet the federally approved program objectives each academic year.

Objective 1: 90% of participants will complete research or scholarly activities each academic year.

Objective 2: 50% of B.A. recipients will enroll in graduate school immediately following graduation.

Objective 3: 80% of first-year graduate students will continue to be enrolled in graduate school.

Objective 4: 10% of participants will attain a Ph.D. within ten years.

Participants

Annually, 27 undergraduates participate in the St. Olaf TRIO McNair Scholars Program.

- Two-thirds of the participants meet federal income guidelines and are from a family in which neither parent graduated from a four-year postsecondary educational institution.
- One-third may be from groups that are traditionally underrepresented in graduate studies.
- Participants have completed at least 2 courses in their major and have a GPA of 2.75 or higher.

Services

McNair Scholars receive assistance with:

- On or off-campus internship/research experience - summer of sophomore year to explore field
- McNair research experience - summer of junior year. Participants are paired with faculty mentors
- Research Writing Course (1 credit and WRI) - summer of junior year to learn how to write an effective proposal, conduct research, and present results
- Preparation for graduate school admissions tests
- Graduate school search and application assistance
- Financial aid, fellowship, and scholarship applications assistance

Highlights

During the summer of 2014, ten students were paired with a St. Olaf faculty mentor who guided their participation in an intensive summer research experience. Working with their mentors, students produced research papers, posters, and presented at the St. Olaf Summer Research Symposium. This booklet highlights the St. Olaf McNair Scholars’ summer research. Faculty mentors support the Scholars and continue to provide guidance about graduate school. Three McNair rising-seniors also participated in *off-campus* summer research/internship experiences.

St. Olaf TRIO McNair Demographic Summary (2008-2014)

Total Number of Scholars Completing Undergraduate Research: 81 Females: 53 Males: 28

Scholar Race/Ethnicity:

Asian American/Hmong: 32

Black/African American: 25

Hispanic/Latino: 9

Native American: 3

Pacific Islander: 2

White: 10

BOTH low-income and first-generation: 74%

Total Number of St. Olaf Faculty Mentors: 48 Females: 22 Males: 26

Mentored more than one student or have participated in more than one McNair summer: 14

Post-Graduation Status:

58% of McNair graduates are enrolled in or have completed graduate school. (includes Class of 2014)

48% of students have completed or are enrolled in a Master's program.

10% of students have completed or are *enrolled* in a Ph.D. program.



Biography of Ronald E. McNair

"Before you can make a dream come true, you must first have one."

Dr. Ronald E. McNair

In 1986, in memory of Ronald McNair, the U.S. Congress established the Ronald E. McNair Post-Baccalaureate Achievement Program, commonly known as the TRIO McNair Scholars Program.

Dr. Ronald E. McNair's career as a scholar and astronaut stands as an inspiration to all McNair Program participants. Ronald McNair, the second African American to fly in space, was born on October 21, 1950 in Lake City, South Carolina. In 1976 McNair earned a Ph.D. degree in Physics at the Massachusetts Institute of Technology and joined the Hughes Research Laboratories. Ronald McNair completed the training and evaluation course for shuttle mission specialists and began working at the Shuttle Avionics Integration Laboratory and later worked for NASA. Even though Dr. McNair's awards and special recognitions are numerous, he will be best remembered as being among those who died on January 28, 1986 when the Space Shuttle Challenger exploded after the launch. Dr. McNair was a mission specialist on that flight. His lifelong commitment to scholarship lives on in the McNair Scholars who are selected each year to participate in the many McNair programs across the United States.

St. Olaf McNair Scholars Staff

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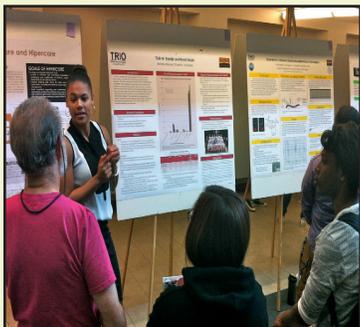


Pictured from left to right:
Melissa Hinderscheit, Janis
Johnson and Heather Campbell



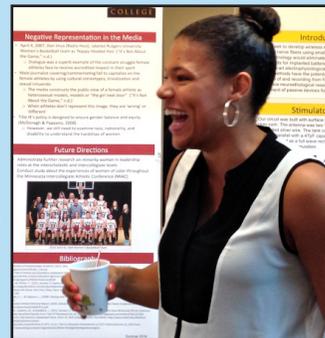
Faculty Mentor:
Dr. Cindy Book

Dr. Cindy Book received her M.Ed. in physical education from Keene State College and then went on to receive her Ph.D. in measurement and evaluation from the University of Minnesota. She was the director of athletics for five years when Tostrud Center was built and is now is an associate professor and the chair of the Exercise Science Department. She currently teaches the senior seminar class for the exercise science majors and supervises departmental distinction projects. One of her main research interest's include the vertical jump measurement. Cindy has been coaching college volleyball for 30 years. Her achievements as a college coach have earned her rankings in the top 10 numbers of wins that she has achieved. She has had several articles and drills published in both on-line and print for volleyball. She also speaks at the Midwest Volleyball Instructors Clinic annually as well as numerous other clinics and camps. With her credentials as a leader, professor and coach, Cindy continues to conduct research that focuses on health and well-being in the sports world.



Sheridan Blanford

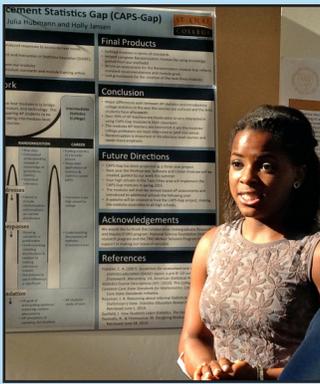
Major: Activities and Sports Administration



“The highlight of my summer with McNair was learning more about Title IX, which is very important to me as an athlete and as a future administrator. I gained valuable research experience and learned a lot more about the process of applying to graduate school. My graduate school goal is to obtain my Master’s degree in Sports Administration. I plan to apply to such schools as the University of Miami, University of Washington, Northwestern University, and University of Minnesota. My future career goals are to become an administrator within the sports industry.”

Research Title: Title IX: Gender and Racial Issues

Abstract: Title IX is a federal law that was passed in 1972 that prohibits discrimination of women who are receiving a federally funded education. One of the main sectors in which Title IX is implemented is in athletics. Title IX mandates an equal opportunity to participate in athletics for male and female athletes. Because of Title IX, there has been an increase in the number of women who participate in sports in high school and college, an increase in the ability of women to receive scholarships and other benefits from certain institutions and most importantly it has changed the classification and incorporation of women’s sports in the expanding global sports industry. Despite the development and improvements from Title IX, women still face issues, including inequalities based on race and gender. Through our research, we investigated the history of Title IX as a whole and the previous ongoing dilemma in the midst of men and women in intercollegiate athletic programs. We also explored the lack of information relating to the connection of race and Title IX.



Mariah Dubose

Majors: Economics and Math

“The highlight of my McNair summer was definitely getting to know my team members and faculty mentor. We did a good job of delegating tasks which allowed each of us to show our strengths and, with collaboration, work on our weaknesses. This made for a very productive and fun research atmosphere. As a junior, I am exploring my options for graduate school but I hope to pursue graduate school in a Biostatistics or Applied Economics. My future goals include working in a field that uses both applied mathematics and economics in order to help solve global economics health issues.”

Research Title: Bridging the Advanced Placement Statistics Gap (CAPS-Gap)

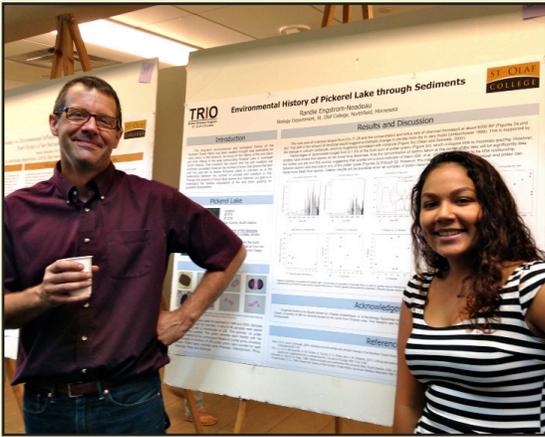
Previous research shows that students, who are qualified and/or extremely well-qualified based on the scores they receive on the advanced placement (AP) statistics exam, often struggle when taking intermediate level courses in college. It is becoming increasingly evident that AP Statistics and introductory level college courses are no longer comparable due to gaps in time, curriculum and technology. Our research focused on bridging the college and advanced placement statistics gap (CAPS-Gap). We believe that this can be achieved by implementing an extended curriculum in the last weeks of the academic school year. The extended curriculum will teach students to think analytically about larger data sets, engage with software and learn about careers in the field. Our hope is that students who engage with the CAPS-Gap curriculum will become prepared to thrive in an intermediate level college course.



Faculty Mentor:

Dr. Sharon Lane-Getaz

Earning her undergraduate degree from the College of New Jersey and her Master’s degree from Hamline University, Dr. Sharon Lane-Getaz has a lot to be proud of. After working for IBM for eighteen years, Dr. Lane-Getaz decided to go back to school to pursue teaching. After receiving her Master’s degree in education, Dr. Lane-Getaz worked in the Minneapolis school district for over three years. In the spring of 2007, Dr. Lane-Getaz accepted a position at St. Olaf College. She is currently an assistant professor in education, mathematics, computer science, and statistics. Her expertise extends outside of the classroom as well. She has published several journal articles and book chapters. Dr. Lane-Getaz has a passion for research, which includes statistics education, and the common misconceptions of statistical measurements such as p-values and statistical significance. During her sabbatical in the 2014-2015 academic year, Dr. Lane-Getaz plans to continue her research and work on her most recent study to enhance the preparation of advanced placement statistics.



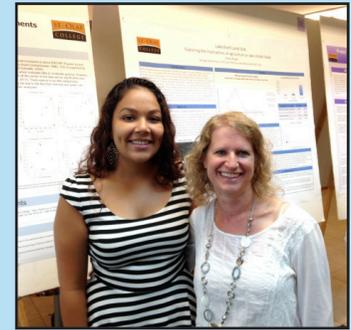
Faculty Mentor:

Dr. Charles Umbanhowar

Dr. Charles Umbanhowar Jr. grew up in Northfield, MN and attended Carleton College where he earned his bachelor's degree in Biology. He received his Ph.D. in Botany and Entomology from the University of Wisconsin-Madison where he researched disturbances to Prairie lands. His research interests include the long-term environmental history of Prairie lands along with prairie management and ecology. He is also interested in how land use and land cover affect lake ecosystems. His teaching interests are in plant morphology, systematic ecology and environmental studies. Dr. Umbanhowar is the author of over 30 scientific journals, 15 of which he is the primary author. He has presented his work at many meetings and conferences around the U.S. and has served as the Chair of the Biology Department at St. Olaf as well as the Program Director of Environmental Studies. During graduate school he received many awards such as the Davis Summer Fellowship and an honorable mention from his NSF Graduate Fellowship. Dr. Umbanhowar is passionate about his field of work and loves to share his passion with eager and determined undergraduates who are willing to learn.

Randie Engstrom-Neadeau

Major: Math



"This summer, I learned a lot academically and personally. Academically, I have gained a lot of knowledge about what it takes to be an ecologist/palynologist. Personally, I have learned a lot about my professional interests. I hope to earn my Ph.D. in the field of mathematics. I want to pursue a career that allows me to help people either in health or security. I have grown to learn that mathematics can be used in so many ways to solve problems that affect people daily. I believe graduate school is important because it will allow me to better understand real-world applications of mathematics in order to make a difference in the world."

Research Title: The Ecological and Environmental History of Pickerel Lake Through Sediments

The long-term environmental and ecological history of the Northern Great Plains has been studied through lake sediments for many years. In this research, we focus on the history of fire and bison and their effects in the area surrounding Pickerel Lake in NE South Dakota. Past research has shown that fire and moisture are positively correlated; however the number of bison that grazed the land over the past ten to twelve thousand years is unknown as is the relationship between the number of animals and moisture or fire. Through the analysis of bison fecal spores and charcoal, our goal was to understand the relative importance of fire and animal grazing on grassland ecosystems. Results suggest periods of increased fire from 6000 B.P. to present. It is uncertain whether there is any correlation in the relationship between fire and bison.

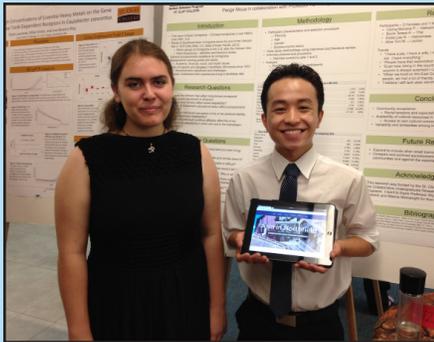
Paoge Moua

Major: Asian Studies

“The highlight of my McNair Summer was interviewing the participants and working on exploring the St. John’s Lutheran Church archive. From my McNair summer, I have learned a lot about how to write a social science research paper, especially how to use Chicago/Turabian citation style. My graduate school goal is to apply to the Master’s in Liberal Studies program at



the University of Minnesota, the Master’s in Criminology, Law, and Justice program at the University of Illinois at Chicago, and the Master’s in Criminology program at Loyola University in Chicago. My future career goals are to get a job working with criminal and community outreach programs to prevent criminal involvement or reduce criminal activities. Graduate school is important to my future goals because it will open doors to many opportunities for me that require a higher degree and will allow me to specialize in the field.



Research Title: Post-Vietnam War Socioeconomic Adjustment of Indochinese-Americans in Northfield, MN

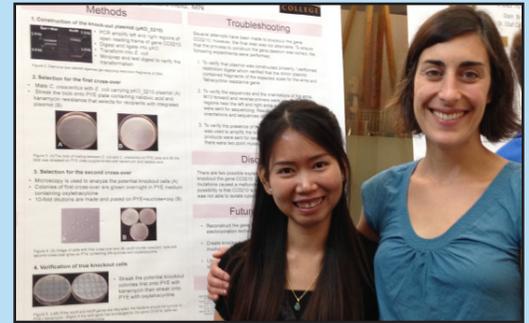
Abstract: Following the Vietnam War, a large wave of Indonesian refugees immigrated to the United States. These new American citizens settled into various communities throughout the U.S., such as Minnesota in the Midwest and California on the West coast. In Minnesota alone, the population of Indonesians has increased dramatically. Our research utilized a case study approach to examine and analyze the experiences of Indonesians living in Northfield, Minnesota to determine characteristics of personal success. The interviews focused on the experiences of the Indonesian participants and their adaptability to their new life in the United States. We found that the atmosphere of Northfield allows many Indonesian immigrants to adjust to the new culture and learn new skills. However, the limitations of a small town impacts the immigrants’ ability to adapt and keep cultural traditions alive. The experiences of the Indonesians living in Northfield are examples of the complexity of the Asian American experience and the role that it plays in socioeconomic adaptability in the U.S.

Faculty Mentor: Dr. Ka Wong

Dr. Ka Wong is currently an Assistant Professor in Asian Studies and Chinese at St. Olaf College. He received his Ph.D. in Chinese and M.A. in Arts from the University of Hawaii and another M.A. in Thai Studies from Chulalongkorn University, Thailand. He is interested in exploring topics related to the symbolic ties and tensions between individual identity and cultural discourse. He also focuses on integrating culture and technology in the process of learning Chinese and in the classroom. He has published various journal articles and book chapters on Chinese language pedagogy, film, literature, and cultural anthropology. In 2006, he published a book titled *Visions of a Nation: Public Monuments in Twentieth Century Thailand*.

Sievhong Pen

Major: Biology



“A highlight of McNair was the University of Minnesota graduate school visit and working closely with my Faculty Mentor. Doing research is challenging, but I developed many valuable skills that will help me succeed in graduate school. I want to become a medical laboratory scientist, microbiologist, or biotechnologist. My career dream is to work in a hospital or clinical setting where I could use my talents and passions to improve the healthcare system. The TRIO McNair program made me believe that attending graduate school is possible for a student like me who is an immigrant and a first-generation college student.”

Research Title: Construction of a Gene Knockout in *C.crescentus*

Abstract: Retinal ganglion cells (RGCs) are the output cells of the retina. The vast majority of these RGCs are responsible for relaying visual information from rod and cone photoreceptors to the brain. However, a minority of these cells, called melanopsin RGCs (mRGCs), project to non-visual centers of the brain that control light dependent behaviors such as pupil constriction and regulation of the circadian rhythm (light/dark cycle). Specifically, these cells are able to tune the body's biological systems to the outside environment. For example, during periods of light, the body produces more hormones that will help an individual with their increased activities; whereas, during periods of darkness, hormone production decreases. Unlike the RGCs involved in vision, mRGCs are themselves photoreceptors. In other words, they are capable of responding directly to light without input derived from rods and cones and are sufficient to drive non-visual light dependent behavior. This raises an intriguing question. If mRGCs can control non-visual behaviors independently of rod and cone input, why are they connected to the rest of the retina? We postulate that rod and cone input help mRGCs estimate mean light levels. To test this hypothesis, it is necessary to measure the intrinsic response of mRGCs to contrast. We did so by recording extracellular mRGC responses to light stimuli with contrast, and without contrast, while blocking rod and cone input. We found that mRGCs responded differently when we blocked their rod and cone input. The intrinsic light responses of mRGCs were largely insensitive to contrast. These results suggest that rod and cone input may not be necessary for mRGCs to be able to accurately estimate mean light levels during periods of high contrast.

Faculty Mentor:

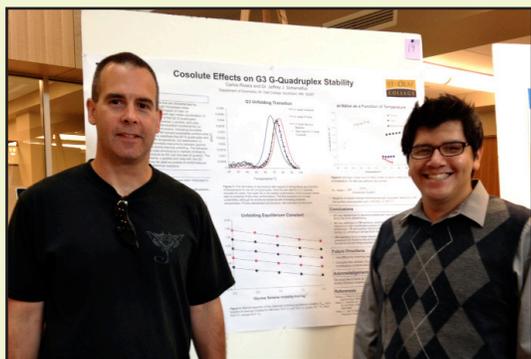
Dr. Lisa Bowers

Dr. Lisa Bowers is an Assistant Professor in the Biology department. Dr. Bowers enjoys teaching and working with students one-on-one in lab. She was born in Milwaukee, WI. She received a B.A in Biology from the University of WI-Green Bay and a Ph.D. in Microbiology from the University of WI-Madison. She engaged in postdoctoral research at the University of CA Berkeley. Her area of expertise and research interest is on the genes that affect the development of aquatic bacterium, which she investigates throughout its life stages. She has published numerous articles on DNA replication and cell cycle regulation. Her most recent publication was in microbiology in 2009, which identified the role of a protein that was required for stalk growth in *Caulobacter crescentus*. She was awarded the National Institute of Health Pre-doctoral Fellowship from 2001 to 2004, Howard Hughes Medical Institute Teaching Fellowship in 2004, and National Institute of Health Postdoctoral Fellowship in 2009. In addition to teaching classes at St. Olaf, she advises Tri-Beta Biological Honor Society and coordinates the Biology Distinction Candidates program.

Carlos Rivera

Major: Chemistry

“The highlight of McNair has been working with Jeff on this project for a second summer. Also, the graduate school trip to the University of Minnesota was very enlightening. I really connected with the professors there and got most of my questions answered. This summer, I also learned how to manage stress. The school year hasn’t been as intensive as the summer where I had constant due dates on top of a 40-hour week schedule. I learned how to better organize myself. My goal is to apply to graduate school in the field of Physical Chemistry or Biological Chemistry. My future goals are to teach at the college level and become an academic in my field who contributes knowledge through research.”



Faculty Mentor:

Dr. Jeff Schweinefus

Dr. Jeff Schweinefus received his B.S. in Chemistry and Mathematics from the University of Wisconsin-La Crosse, his M.S. in Chemistry from the University of Michigan, and his Ph.D. in Physical Chemistry from the University of Michigan. His research interests include nucleic acid structure stabilization, and cosolute interactions with nucleic acids. Dr. Schweinefus has published numerous articles focused on nucleic acid stability which are published in biochemical, physical and educational chemistry related journals. His awards include, but are not limited to, fellowships and major grants from NIH awarded for his interesting and innovative research.

Research Title: Cosolute Effects on G3 G-Quadruplex Stability

Abstract: G-quadruplexes are comprised of G-quartets that are characterized by coplanar arrangement of four guanines through Hoogsteen base-pairing. Consecutive G-quartets can initiate formation of inter- or intramolecular four stranded G-quadruplexes with tight metal coordination. In this study, we have characterized the stability of the G3 G-quadruplex (d(G3T2G3TGTG3T2G3)) in aqueous glycine betaine, L-proline, and urea potassium chloride solutions using thermal denaturation monitored by uv-absorbance. G3 was destabilized in urea and proline, indicating favorable interactions between urea and proline and the solvent-accessible surface area exposed during unfolding. Glycine betaine stabilized the G3 G-quadruplex although the degree of stabilization decreased with temperature. G3 stabilization in glycine betaine solutions indicated unfavorable interactions between glycine betaine and the surface area exposed during thermal unfolding. The behavior of G3 in glycine betaine, proline, and urea solutions is in marked contrast to the G2 G-quadruplex (same loop structure as G3, but one less G-quartet). The differential interactions of glycine betaine, L-proline and urea with the G3 oligomer suggest these cosolutes may be used as probes of conformational and surface area changes during biochemical reactions.

Faculty Mentor:
Dr. Gary Muir

Dr. Gary Muir is an Associate Professor at St. Olaf College. He graduated from the University of Otago with a graduate degree in Psychology. His research interests lie in the Neurobiology of Navigation, which he has been studying since his undergraduate years. Dr. Muir has published numerous articles as well as book chapters in the field of head direction cells and academic mentoring. He was awarded the Walter D. Mink Outstanding Undergraduate Teacher Award in 2008 and the Distinguished Mentor award in 2009 for co-organizing the annual Midbrains conference. Dr. Muir enjoys both teaching and research.

Michele Severson

Major: Biology

"I loved coming into the lab to conduct research every day. My McNair summer research experience taught me to have greater patience

in research. My goal is to attend graduate school to pursue a career in Occupational Therapy and become an Occupational Therapist and help people lead more fulfilling lives."



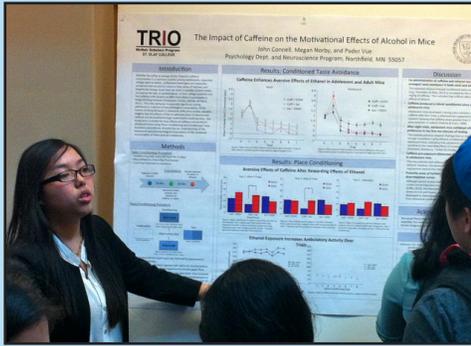
Alex Thompson

Major: Psychology

"The highlight of my summer was researching in an area that was relatively new to me. I was challenged throughout the summer which allowed me take away a lot from my experience. Through the McNair summer I was able to grow professionally and academically. Whether it was meeting with my mentor or discussing research articles in class, each day I had an experience that helped me discover what I want to do after completing my undergraduate education. I plan to attend graduate school for a Ph.D./Psy.D. in Clinical/Counseling Psychology after graduating from St. Olaf. My career goal is to be a practicing and supervising psychologist. In order to do this, attaining a doctorate degree in clinical/counseling psychology is necessary."

Research Title: Influence of Visual Cues on Head Direction Cell Firing Following Anesthesia

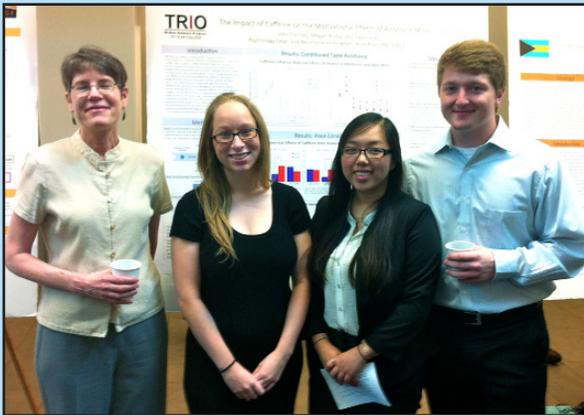
Abstract: How we navigate on a neural level is a complex and mysterious phenomenon. One group of neurons thought to play a role in navigation and spatial orientation are called head direction (HD) cells. HD cells are thought to represent head directionality in the brain because they fire when the head faces a specific direction. HD cells are controlled by a variety of internal and external cues. Our experiment investigated these neurons using electrophysiology (single neuron recordings in a freely moving organism) to determine the effect a visual cue has on HD cell directionality. A baseline recording was completed to determine HD cell directionality. Afterwards, the rat was anesthetized and placed on a table while the cue card was removed. Another recording was done to see any changes in HD cell directionality. Results from four rat HD cells suggest that cell directionality is heavily influenced by visual cues in the environment. However, there are other factors that modify HD cell preferred direction, because when the visual cue is removed, three of the four cells retained their baseline directionality. These results suggest there is either an uncontrolled external cue or a preserved internal cue. Both of these could explain how the HD cell returns to its original position following visual cue removal.



Pader Vue

Major: Psychology

“The highlight of my summer was working together with my research team and planning for the conferences that we will be presenting at in the fall. This has definitely been a summer for future planning and self-discovery. I learned that research is not something that I would want to do long-term. I realized that I would much rather work with humans than animals. I would like to go to graduate school either in counseling or clinical psychology in order to earn my Psy.D. to become a health psychologist. Graduate school would provide me with the clinical experience and background necessary to become a successful health psychologist. Summer research has been great and I also really enjoyed the graduate school visit to the University of Minnesota.”



Research Title: The Impact of Caffeine on the Motivational Effects of Alcohol in Mice

Abstract: Whether it is coffee or energy drinks, adolescents and college-aged students, are utilizing caffeine to stay awake and increase their energy. As a result, mixtures of caffeine with alcohol are popularly consumed by college-aged students via mixtures like Red Bull and vodka. Caffeine keeps the drinker awake and blunts the sedative effects of alcohol, giving the user a false sense of soberness which can result in greater alcohol intake. Our research explored whether caffeine has any effects on alcohol/ethanol. A conditioned place preference test was used on 30 Swiss Webster mice with half in adolescence and half in adulthood. The mice received an injection of caffeine and were then placed on a grid or rod textured floor. Afterwards they received an ethanol injection and were placed on the other grid or rod textured floor. A final test was used to determine which textured floor the mice preferred, ultimately telling us which injection they liked more. We expected that the mice would prefer the ethanol paired floor more than the caffeine paired floor.

Faculty Mentor: Dr. Shelly Dickinson

Dr. Shelly Dickinson is currently Chair of the Psychology Department at St. Olaf College. She received her Ph.D. in Behavioral Neuroscience from Oregon Health Science University. Her research interests include addiction and the cue saliency, cues that are associated with different drug addictions, as well as the effects of caffeine on ethanol in adolescents. Professor Dickinson has had multiple publications and has received several awards and honors such as the 2013 Magnus the Good Award, 2009 Walter D. Mink Minnesota Undergraduate Psychology Teacher of the Year, and the 2009 Distinguished Mentor Award for Faculty in Undergraduate Neuroscience.



“The highlight of my McNair summer was getting the stimulator to work effectively and being able to visually see electrophysiological stimulation. I learned how to conduct research and how I can best prepare myself for success in graduate school. My goal is to be accepted into a dental school and earn my license to practice. I want to be a health care provider to alleviate suffering in individuals while also working in a profession that is demanding and will push me to be the best person I can be. Graduate school will help me prepare and learn the skills necessary to do so.”

Chad Wagner

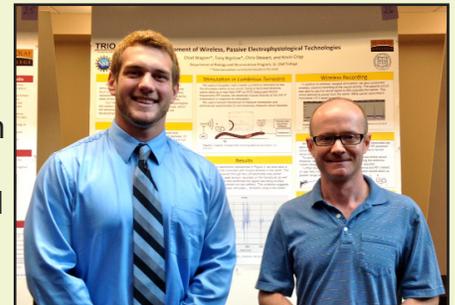
Major: Biology

Research Title: Development of Wireless, Passive, Electrophysiological Technologies

Abstract: Modern techniques for electrophysiological stimulation require an organism to either be tethered to a long wire or to carry a battery in order to supply a stimulus. Wires only allow a certain range for the animal to move, while batteries can be large and generate excess heat. These techniques inhibit the animals mobility therefore making them ineffective to study natural animal behaviors. Our goal was to create a wireless, passive (without battery), electrophysiological stimulator that could be implanted in the tissue of an animal. To do so we developed a resonant circuit that was able to receive a stimulus from a near-field, radio frequency source and deliver a measurable stimulus to a *L. Terrestris* (common earth worm). Our circuit must still be miniaturized and a high efficiency tuned antenna must be developed. If we are able to accomplish these tasks we would be able to wirelessly stimulate neurons in an organism while giving the animal freedom of motion. This accomplishment would allow for greater accuracy when performing studies on animal behavior and would be a first step towards the development of an advanced era of microscopic medical devices.

Faculty Mentor: Dr. Kevin Crisp

Dr. Kevin Crisp attended Haverford College graduated with departmental honors as a psychology major with concentrations in brain and behavioral sciences. During his undergraduate career, he also spent a year abroad studying anatomy and developmental biology at the University College in London, England. He then attended the University of Minnesota’s doctoral program and earned his Ph.D. in Neuroscience in February of 2003. Dr. Crisp spent two years conducting research; from 2003-2004 he worked as a post-doctoral fellow at the University of Minnesota, and from 2004-2005 he worked as a post-doctoral researcher at the University of Miami. In 2005, he became an assistant professor at St. Olaf College and became an associate professor in 2011. Professor Crisp also served as the neuroscience program director during the 2010-2011 academic year. He currently teaches courses in biology and neuroscience, and is acting chair of the Health Professions Committee. Dr. Crisp is passionate about mentoring students and is involved with organizations such as St. Olaf Pre-Health Club, Mayo Innovations Scholars, TRIO McNair Scholars program and many others. He has been awarded for his commitment to mentoring by receiving a SOMOAS neuroscience mentoring award. Professor Crisp’s research interests are in the field of neurobiology; however he has been published many times in various other fields. His own research focuses on the neuroscience of medicinal leeches.



OFF-CAMPUS EXPERIENCES



Lacey Etzkorn

Majors: Math and Environmental Studies

Summer Experience: Survey Methodology, U.S. Department of ED
Location: Washington D.C.

I enjoyed learning more about agricultural and environmental policy and have built my professional confidence. I was also able to spend a lot of time studying for the GRE and exploring graduate programs. My goal is to apply to doctorate programs in Biostatistics. I plan to do my research in Environmental Biostatistics or public health issues related to food and communities. My graduate school education will help me to build a foundation in Environmental Biostatistics and immerse me in a community of scholars with related interests.

Hawera Butta

Major: Biology

Summer Experience: REU - Colorado State

Research: Halogen Bonds in Ty Lysozyme

Location: Colorado State University

Faculty: Dr. P. Shing Ho, Biochemistry



The highlight of my summer was doing research for an extended period of time. I was able to acquire valuable lab skills and techniques. My future goal is to pursue a doctoral degree and conduct medical research.



Abdi Musse

Major: Biology



Summer Experience: Schoolzilla

Location: University of California - Berkeley

Abdi worked with a team of engineers and designers to develop systems that made education data more accessible for educators. He gained professional skills and learned a lot about graduate school programs that combine the fields of technology and life science. He visited graduate schools and met with investors and executives. He plans to apply to graduate programs in the field of Human Computer Interaction. He really loves the combination of life science with technology.

